LFGTE CASE STUDY: Albuquerque, New Mexico, USA

by

Linda Nutting

SCS ENGINEERS

Los Angeles Landfill Profile

- Located in southwest United States
- Owned and operated by the City
- 8 inches average annual rainfall
- Partial LFG collection system
- Dates of Operation: 1978 to 1983
- 77 acres
- 2.8 million tons of municipal waste

Why consider a project?

- **Low-cost local energy source**
- **Excellent medium Btu fuel for boilers and gas-fired generators**
- **Qualifies as renewable resource in most states**
- **Reduce greenhouse gas emissions**

Is there enough landfill gas?

- **Typical Landfill Rule-of-Thumb**
  - **1 million tons WIP = 1 MW**
- **Does this hold true for a landfill in an arid region?**

Changes for arid climate

- **Lower rate of decomposition**
- **Lower k value (generate gas more slowly) than sites in wetter regions**
- **Longer production curves (less gas but over a longer period of time)**

LFG Model Defaults

- **K = 0.025/year (0.050/ year typical)**
- **Lo = 2,900 ft3/ton**

*Calibrated based on actual data from 35 landfills located in CA & AZ.

Results

- Arid Region Landfill
  - 2.5 million tons = 1 MW
- Albuquerque Pilot study
  - 10-15 mmBTU/hour (support a 1 MW project)

Potential Uses

- Direct Use (Boiler)
  - is there a facility nearby
  - natural gas prices
- Electricity Generation
  - Transmission line near the site
  - Electricity prices
- High Btu Upgrade
  - Quantity of gas
  - Natural gas prices

Identifying an End Use

- **Within a 5-mile radius of landfill**
- **Rights-of-way can be secured**
- **Large, constant energy demand**

= **Allied Signal Plant**

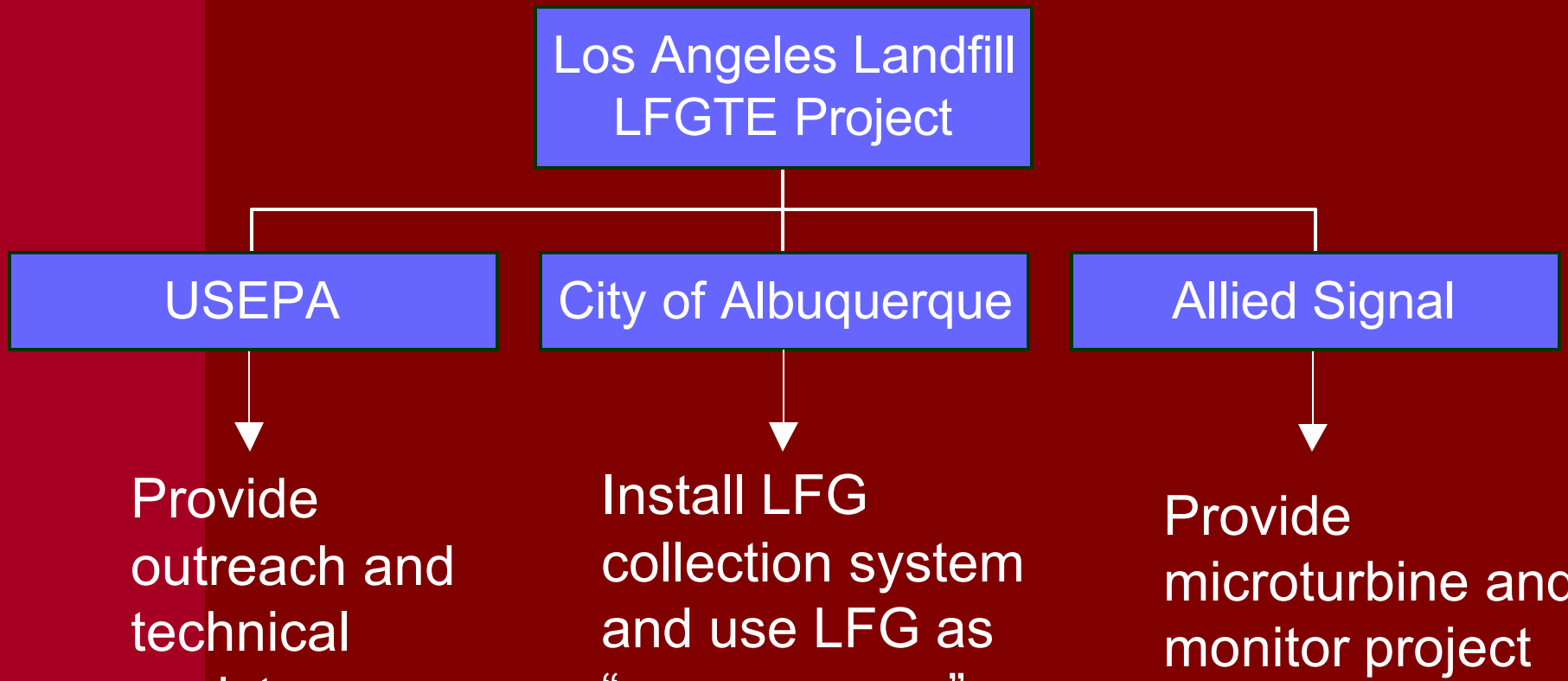
Discovery!

Allied Signal Plant adjacent to landfill is producing a microturbine that operates on natural gas

Turbogenerator Specifications

- **75 kW (units can be clustered to produce up to 1 MW)**
- **Produces 9 ppm NOx**
- **Maintenance every 10,000 hours**
- **Operates on 75 psi (can include a compressor within the unit)**

Establishment of Partnership



Allied Signal/City of Albuquerque

- **First landfill gas microturbine project**
- **Public/private partnership**
- **Albuquerque Renew**

Albuquerque Renew

- Partnership between the City of Albuquerque and local industry
- Centered around the re-use of local natural resources
- Highlight - pilot project using Allied Signal microturbine to turn LFG into an alternative energy source

Pilot Study

- Phase I - Demonstrate Parallon 75 burns landfill gas
- Phase II - Sign MOU and perform public demonstration
- Phase III - Determine power output, durability, and package design

Project Development Issues

- **Provide access to site**
  - **Ongoing construction project**
- **OSHA Requirements**
  - **Explosion area**
- **Maintain control of landfill gas migration problem**
  - **Minimize extraction system shutdown**

Project Development Issues

- **Layout, connection of the Parallon 75 to the existing extraction system**
- **Coordination with the local utility company**
- **Impact on the International Balloon Fiesta**

Project Highlights

- **Arid climate landfill success story**
- **Public/private development of project**
- **Turbogenerator is produced at the Albuquerque facility**
- **LFG used to produce power for the International Balloon Fiesta Park**

Good PR for the Landfill

- Press Conference
- Mayor and Allied Signal CEO
- Media
- State Legislators
- USEPA
- Public Regulatory Commission

Future of the Project

- **Continue with Phase III of the Pilot Study**
- **Continue with RENEW as a yearly event**
- **Assist the State Legislature with "green power" legislation**
- **Assist other municipalities with landfill gas issues**